



Los Alamos National Laboratory names six scientists as 2009 Fellows

November 5, 2009

Recognizes sustained, outstanding scientific contributions

Los Alamos, New Mexico, November 5, 2009—Antoinette “Toni” Taylor, Stephen Becker, Joachim Birn, Lowell Brown, Patrick Colestock, and Samuel “Tom” Picraux have been designated 2009 Los Alamos National Laboratory Fellows in recognition of sustained, outstanding scientific contributions and exceptional promise for continued professional achievement.

The title of Fellow is bestowed on only about 2 percent of the Laboratory’s current technical staff. The new Fellows come from myriad scientific disciplines and have sustained high-level achievement important to the Laboratory, become recognized authorities in their fields, and made important discoveries used or cited by peers inside and outside the Laboratory.

“These distinguished scientists were chosen as 2009 Laboratory Fellows based on a very rigorous peer review process and honored for their considerable scientific accomplishments,” said Terry Wallace, principal associate director for Science, Technology, and Engineering. “I am pleased to have such a distinguished class of Fellows for 2009 that reflects the diversity of top-notch scientific talent at Los Alamos National Laboratory.”

Fellows play a continuing role in helping maintain the scientific excellence of the Laboratory. Fellows are often asked by the Laboratory director to assess issues and provide advice. As recognized leaders, Fellows are advocates for the continuing conduct of science at the Laboratory.

Toni Taylor leads the Laboratory’s Materials Physics and Applications Division and is a pioneer in electromagnetic metamaterials as well as terahertz science and technology, and in applying coherent control techniques to ultrafast optics, which provide unique insight into condensed-matter physics.

Taylor has made key contributions in the exploration of fundamental properties of superconductors through ultrafast techniques; made key demonstrations of exquisite control of phase and amplitude in ultrafast pulses leading to coherent control of propagation in fibers; and has contributed to novel metamaterial concepts leading to devices with unique dielectric properties. She has written or cowritten 250 publications, wrote two book chapters, edited three books, and has mentored 32 postdoctoral

researchers. Taylor is a Fellow of the American Physical Society and American Association for the Advancement of Science, and the Optical Society of America.

Stephen Becker of the Laboratory's Applied Physics Division conducts research in astrophysics, weapons design, and intelligence assessment. His work has received nearly 1,200 citations. Becker has participated in several nuclear tests, leading the design effort on four. His understanding of thermonuclear weapons design and interpretation of radiochemical diagnostics is recognized by colleagues nationally and internationally. Becker has made major contributions to the Stockpile Stewardship program and has had a major impact on his scientific field through analysis of nuclear deterrence. He has advised both Los Alamos and Lawrence Livermore national labs on the complexities of the aging nuclear stockpile.

Joaquin Birn of the Space Science and Applications Group studies complex plasma physics phenomena and reconnection, particularly in the Earth's magnetosphere and solar corona. Birn's development of a physical model of the static Earth's magnetotail, and his development of the most comprehensive magneto-hydrodynamic computational model for the dynamic magnetotail, is used as a benchmark for calculations of magnetotail dynamics. His magnetosphere research has been valuable to the Laboratory's nuclear test detection programs; his influential work is significantly increasing the accuracy of predictions for the behavior of energetic electrons from high-altitude nuclear explosions.

Birn is the Laboratory's principal investigator for the Los Alamos Sun-Earth Connections Theory Program, NASA's major effort in the theory and modeling of space plasmas.

Lowell Brown of the Methods and Algorithms Group in the Applied Physics Division has made many contributions to physics, from quantum field theory, particle and nuclear physics, gravitation, and astrophysics, to cold atom traps and fully ionized plasmas. His research has spanned an era from the rise of ion beam science to current breakthroughs in nanoscience. Brown has 118 publications (7,049 citations) and his textbook on quantum field theory is quickly becoming a classic. He is an American Physical Society and American Association for the Advancement of Science Fellow, was the editor in chief of Physical Review D, and was on the executive committee of the APS Division of Particles and Fields. He was a National Science Foundation postdoc, and a Guggenheim Fellow at CERN.

Patrick Colestock is leader in applied plasma physics for accelerator applications and trans-ionospheric sensing of the Laboratory's Space and Remote Sensing Group. He is an expert in basic and applied plasma physics, and the physics of intense charged-particle beams. Among his scientific accomplishments, he has made pioneering contributions to the historic cyclotron resonance heating experiments on the Tokamak Fusion Test Reactor and the Princeton Large Torus. He also helped optimize the performance of the Main Ring and Tevatron at Fermilab. He has 169 publications (4,363 citations). Colestock has testified before Congress on the future of fusion reactors and has served on several technical review panels of the National Science Foundation and Nuclear Regulatory Commission.

Samuel "Tom" Picraux is chief scientist of the Laboratory's Center for Integrated Nanotechnologies. Picraux is known internationally for use of energetic ion beams for the characterization of materials, as well as for his advances in surface processing and epitaxy. Using his quantitative ion beam analysis developments, Picraux and his group pioneered the use of surface probes of the plasma edge to diagnose conditions in the U.S. and European tokamak experiments in fusion energy. Picraux and his colleagues

pioneered the field of ion implantation metallurgy, creating a standard process for fabrication in the semiconductor industry.

A 1990 E.O. Lawrence Award recipient for his developments in ion-challenging and related ion-beam techniques for materials characterization, Picraux has more than 250 publications (6,500 citations). He coauthored one book and edited six others. He is a Fellow of the American Physical Society, American Academy for the Advancement of Science, and the Materials Research Society.

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